

WHAT IS CLAIMED IS:

1. A test structure that supports the characterization of an optical component  
2 comprising:  
3       an input port for receiving an input signal;  
4       first and second test ports for optically connecting said test structure to said  
5       optical component, said first test port being optically connectable to said input port  
6       such that said input signal can be supplied to said optical component through said first  
7       test port;  
8       a first optical path for receiving a first optical response signal from said first  
9       test port, said first optical response signal resulting from application of said input  
10      signal to said optical component;  
11       a second optical path for receiving a second optical response signal from said  
12      second test port, said second optical response signal also resulting from application of  
13      said input signal to said optical component; and  
14       means for combining a first portion of said input signal with said first optical  
15      response signal and for combining a second portion of said input signal with said  
16      second optical response signal.

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1       2. The test structure of claim 1 wherein said first optical path includes a first test  
2       coupler that optically connects said input port, said first test port, and said means for  
3       combining said first portion of said input signal with said first optical response signal.

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1       3. The test structure of claim 1 wherein said means for combining said first  
2       portion of said input signal with said first optical response signal and for combining  
3       said second portion of said input signal with said second optical response signal  
4       includes:  
5        an input coupler for splitting said input signal;  
6        a first receiver coupler that is optically connected to said input coupler and to  
7        said first optical path and that is optically connectable to a first receiver; and  
8        a second receiver coupler that is optically connected to said input coupler and  
9        to said second optical path and that is optically connectable to a second receiver.

1 4. The test structure of claim 3 wherein:

2       said first optical path includes a first test coupler that optically connects said  
3 input coupler, said first test port, and said first receiver coupler; and  
4       said second optical path includes a second test coupler that optically connects  
5 said input coupler, said second test port, and said second receiver coupler.

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1 5. The test structure of claim 4 wherein said input coupler, said first and second  
2 test couplers, and said first and second receiver couplers are integrated into a single  
3 substrate.

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1 6. The test structure of claim 4 further including:

2       a switch that is connected in an optical path that is between said input port and  
3 said first and second test ports; and  
4       an optical path between said switch and said second test port;  
5       wherein said switch allows said input signal to be applied to said optical  
6 component through either said first test port or said second test port.

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1 7. The test structure of claim 1 further including:

2       a switch that is connected in an optical path that is between said input port and  
3 said first and second test ports;

4       an optical path between said switch and said second test port, wherein said  
5 switch allows said input signal to be applied to said optical component through either  
6 said first test port or said second test port;

7       said means for combining said first portion of said input signal with said first  
8 optical response signal and for combining said second portion of said input signal  
9 with said second optical response signal includes:

10           an input coupler for splitting said input signal;

11           a first receiver coupler that is optically connected to said input coupler  
12 and to said first optical path and that is optically connectable to a first receiver;  
13 and

14           a second receiver coupler that is optically connected to said input  
15 coupler and to said second optical path and that is optically connectable to a  
16 second receiver;

17        said first optical path including a first test coupler that optically connects said  
18    input coupler, said first test port, and said first receiver coupler; and  
19        said second optical path including a second test coupler that optically connects  
20    said input coupler, said second test port, and said second receiver coupler.

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1        8.        The test structure of claim 1 wherein said first optical response signal  
2    represents a portion of said input signal that is reflected by said optical component  
3    and wherein said second optical response signal represents a portion of said input  
4    signal that passes through said optical component.

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1        9.        The test structure of claim 1 wherein said input signal is a swept highly  
2    coherent signal.

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1        10.       The test structure of claim 1 further including first and second optical  
2    receivers that are optically connected to said means for combining, said first optical  
3    receiver being optically connected to receive said combined first portion of said input  
4    signal and said first optical response signal and said second optical receiver being  
5    optically connected to receive said combined second portion of said input signal and  
6    said second optical response signal.

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1        11.       The test structure of claim 10 wherein said first and second optical receivers  
2    include polarization diversity receivers.

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1        12.       The test structure of claim 10 wherein said first and second optical receivers  
2    are integrated into said test structure.

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1        13.       The test structure of claim 12 further including electrical connection ports for  
2    electrically connecting said first and second optical receivers to a signal processor.

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1        14.       The test structure of claim 1 wherein said first and second optical paths and  
2    said means for combining said first portion of said input signal with said first optical  
3    response signal and for combining said second portion of said input signal with said  
4    second optical response signal are integrated into a single substrate.

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1 15. A test structure that supports the characterization of an optical component  
2 comprising:  
3       a substrate, said substrate including;  
4       an input port for receiving an input signal;  
5       first and second test ports for optically connecting said test structure to said  
6 optical component, said first and second test ports being optically connectable to said  
7 input port such that said input signal can be supplied to said optical component  
8 through either said first test port or said second test port;  
9       first and second receiver ports optically connectable to first and second  
10 receivers;  
11       a first optical path for supplying a first optical response signal from said first  
12 test port to said first receiver port, said first optical response signal resulting from  
13 application of said input signal to said optical component;  
14       a second optical path for supplying a second optical response signal from said  
15 second test port to said second receiver port, said second optical response signal also  
16 resulting from application of said input signal to said optical component; and  
17       means for combining a first portion of said input signal with said first optical  
18 response signal before said first portion of said input signal and said first optical  
19 response signal reach said first receiver port and for combining a second portion of  
20 said input signal with said second optical response signal before said second portion  
21 of said input signal and said second optical response signal reach said second receiver  
22 port;  
23       said first receiver port being optically connected to receive said first portion of  
24 said input signal and said first optical response signal after said signals are combined  
25 and said second receiver port being optically connected to receive said second portion  
26 of said input signal and said second optical response signal after said signals are  
27 combined.

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1 16. The test structure of claim 15 wherein said first optical path includes a first  
2 test coupler, integrated into said substrate, that optically connects said input port, said  
3 first test port, and said means for combining a first portion of said input signal with  
4 said first optical response signal.

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1 17. The test structure of claim 15 further including:  
2 a to-switch intermediate port for optically connecting said input port to an  
3 input of a switch;  
4 a first from-switch intermediate port for optically connecting a first output of  
5 said switch to said first test port; and  
6 a second from-switch intermediate port for optically connecting a second  
7 output of said switch to said second test port.

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1 18. The test structure of claim 17 wherein said means for combining said first  
2 portion of said input signal with said first optical response signal and for combining  
3 said second portion of said input signal with said second optical response signal  
4 includes:

5 an input coupler, integrated into said substrate, for splitting said input signal;  
6 a first receiver coupler, integrated into said substrate, that is optically  
7 connected to said input coupler, to said first optical path, and to said first receiver  
8 port; and  
9 a second receiver coupler, integrated into said substrate, that is optically  
10 connected to said input coupler, to said second optical path, and to said second  
11 receiver port.

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1 19. The test structure of claim 17 wherein:  
2 said first optical path includes a first test coupler, integrated into said  
3 substrate, that optically connects said input coupler, said first test port, and said first  
4 receiver coupler; and  
5 said second optical path includes a second test coupler, integrated into said  
6 substrate, that optically connects said input coupler, said second test port, and said  
7 second receiver coupler.

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1 20. The test structure of claim 15 wherein said first and second optical response  
2 signals are supplied substantially simultaneously to the respective receiver ports.

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1 21. A test structure that supports the characterization of an optical component  
2 comprising:  
3       an input port for receiving an input signal;  
4       a switch optically connected to said input port;  
5       first and second test ports for optically connecting said test structure to said  
6 optical component, said first and second test ports being optically connectable to said  
7 switch such that said input signal can be supplied to said optical component through  
8 either said first test port or said second test port;  
9       a first optical path for receiving a first optical response signal from said first  
10 test port, said first optical response signal resulting from application of said input  
11 signal to said optical component;  
12       a second optical path for receiving a second optical response signal from said  
13 second test port, said second optical response signal also resulting from application of  
14 said input signal to said optical component;  
15       a first receiver coupler, connected along said first optical path, for combining a  
16 first portion of said input signal with said first optical response signal; and  
17       a second receiver coupler, connected along said second optical path, for  
18 combining a second portion of said input signal with said second optical response  
19 signal.

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1 22. The test structure of claim 21 wherein:  
2       said first optical path includes a first test coupler that optically connects said  
3 switch, said first test port, and said first receiver coupler; and  
4       said second optical path includes a second test coupler that optically connects  
5 said switch, said second test port, and said second receiver coupler.

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1 23. The test structure of claim 21 further including an input coupler that optically  
2 connects said input port to said switch, said first receiver coupler, and said second  
3 receiver coupler.